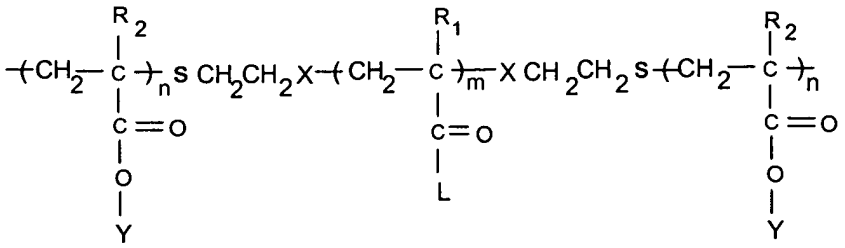
Claim

1. Tri-block copolymers of molecular weight ranging between 2,000 Daltons to 2,00,000 Daltons having formula (1), having extraordinarily high binding strength,



Formula (1)

wherein,

R_1 is H, CH_3, C_2H_5, or C_6H_5; R_2 is H, CH_3, C_2H_5, or C_6H_5; here, R_2 at aforementioned two positions can be either identical or different; X is an ester or amide linkage; m is ranging from 3 to 500; n is ranging from 2 to 50; L is OH, NH_2,OCH_3, or $NHCH(CH_3)_2$; Y is *N*-Acetyl Glucosamine, mannose, galactose, sialic acid, fructose, ribulose, erythrolose, xylulose, psicose, sorbose, tagatose, glucopyranose, fructofuranose, deoxyribose, galactosamine, sucrose, lactose, isomaltose, maltose, cellobiose, cellulose, or amylose.

2. The tri-block co-polymer as claimed in claim 1, wherein the co-polymer is stable, and usable.
3. The tri-block co-polymer as claimed in claim 1, wherein the said co-polymer shows about 11,000 times increase in the binding strength as compared to the ligand alone.
4. A simple and effective process for the preparation of tri-block copolymers of formula (1) of claim 1, said process comprises steps of:
   a. dissolving the polymer of formula 3 bearing di-functional groups at both terminal ends in a solvent,
   b. adding a polyvalent oligomer of formula 2 into the dissolved polymer of step (a) in the ratio of about 1:2 for di-functional group to polyvalent oligomer to obtain a reaction mixture,
   c. dissolving a coupling agent to the reaction mixture in the ratio of about 1:1 to initiate the reaction,
   d. allowing a reaction for a time duration ranging between 24 hrs to 48 hrs at room temperature ranging between 15 to 45^0C,

e. removing the unreacted coupling agent after the reaction by filtration to obtain tri-block polymer,

f. precipitating the tri-block polymer in a non-solvent at room temperature to obtain the dried tri-block copolymers.

5. A process as claimed in claim 4, wherein the polymers bearing di functional groups at both ends is selected from a group comprising acrylic acid, methacrylic acid, methacryloyl chloride, acrylamide, *N*-isopropyl acrylamide (NIPA), 2-acrylamido-2-methyl propanesulphonic acid (AMPS) methacrylate, acryloyl chloride, acryloyl morpholine, vinyl pyrrolidone, styrene, allyl alcohol, and allyl amine.

6. A process as claimed in claim 4, wherein the polymers bearing di functional groups at both ends contain COOH group.

7. A process as claimed in claim 4, wherein the polyvalent oligomer containing terminal reactive group ligands is selected from a group comprising polymethacryloyl NAG, polyacryloyl NAG, and Poly vinyl benzyl NAG.

8. A process as claimed in claim 4, wherein the oligomer containing terminal reactive group contain OH or NH_2 group.

9. A process as claimed in claim 4, wherein the organic solvent is selected from a group comprising dimethyl formamide, tetra hydro furan, and di-methyl sulfoxide.

10. A process as claimed in claim 4, wherein the coupling agent used is selected from a group comprising compounds Di Cyclohexyl Carbodiimide (DCC), 1-Cyclohexyl 3-(2- Morpholinoethyl) Carbodiimide metho-p-toluenesulfonate (CMC), and 1-Ethyl-3-(3-Dimethylamino-propyl) Carbodiimide (EDC).

11. A process as claimed in claim 4, wherein the molar ratio of coupling agent to polymer is about 1:1.

12. A process as claimed in claim 4, wherein the non-solvent is selected from a group comprising acetone, diethyl ether, hot water, and hexane.

13. A method of preventing and/or treating microbial infections, wherein the said method comprises steps of exposing the microbe to the pharmaceutically effective amount of tri-block copolymer of formula 1, and thereafter, binding of the polymer to the microbe inhibits the microbial infection.

14. A method of treatment as claimed in claim 13, wherein the possibility of drug resistance does not exist.

15. A method of treatment as claimed in claim 13, wherein the said method helps prevent and or treat infection caused by influenza virus, wheat germ agglutinin and rotavirus.

16. A method of treatment as claimed in claim 13, wherein the % increase in the relative inhibition of the microbe (I_{max}) is about 60%.

17. A method of treatment as claimed in claim 13, wherein the said co-polymer shows about 11,000 times increase in the binding strength as compared to the ligand alone.